

2008

Annual Water Quality Report



Dear Resident,

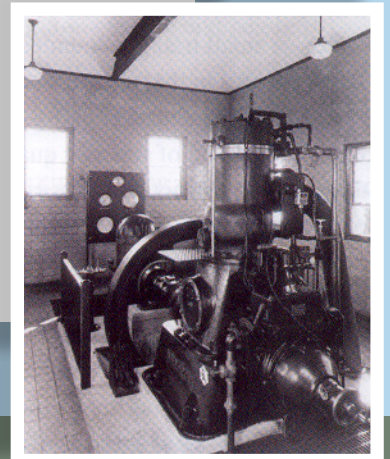
June 22, 2009

The 1996 Safe Drinking Water Act Amendments require all public water systems to provide residents with an annual water quality report referred to as the “Consumer Confidence Report”. The CCR provides the water department with an opportunity to share information regarding drinking water with its customers.

This Report covers all water testing completed from January through December 2008 and other important aspects about your drinking water. The Town of Needham strives to deliver high quality water to the residents and businesses. Needham has taken many steps toward achieving these goals, including water quality testing programs and distribution system improvements. With a focus on customer service and efficiency of operations, we are committed to delivering safe drinking water for years to come. While maintaining water quality is critical, protecting our water supply by conservation is equally as important as we look towards the future. We encourage you to take time to read this report — If you have any questions, please contact the water treatment plant manager at (781) 416-4071.

Sincerely,

Robert A. Lewis
Water & Sewer Superintendent



*Needham Well Pump House
circa 1936*

Needham's Historic Water Supply

The following is a story from the Boston Sunday Globe News Section dated May 9, 1937:

"WELL DIGGERS OF WORLD WATCHING AMAZING 93-FOOT SHAFT IN NEEDHAM. Engineers Believe It Must Tap Huge River Which Disappeared Million Years Ago May Be Once Mighty Merrimac Which Glacier Dammed at Lowell and Pushed East Towards Ocean."

"With the coming of warm and drier weather, plus a steadily increasing consumption of water, water-supply engineers of the world are watching the great new municipal well in Needham, put into production three months ago. This well is considered one of the most remarkable in the world in that its supply of water is apparently inexhaustible.

Tests conducted by X. Henry Goodnough Inc., the engineers who developed the well, actually taps the bed of the pre-glacial Merrimac River. The well taps ground water drained from a vast area of Eastern Massachusetts. Literally, it sucks up water out of a great underground river which, flowing through sand and gravel 100 feet underground, drains thousands of square miles of Massachusetts hills and valleys. More than 1,000,000 years ago, the Merrimac, which used to flow down from New Hampshire just south of Boston, was diverted by the glacier, which then covered New England and made to flow east from Lowell to the sea instead of southeast through Greater Boston. The old bed of the stream was filled with sand and gravel and hidden deep below the new land surface but ground water continued to flow along the old course filtering through the sand until now it is tapped to supply modern Needham with a rich supply of icy cold water — water which is as good as any in all the world.

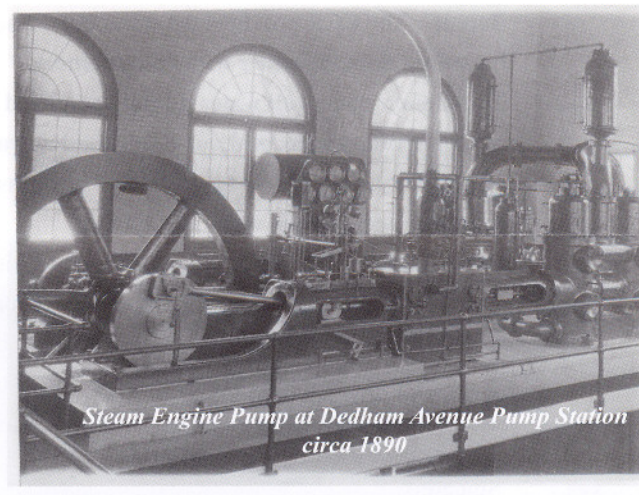
Up to 1936, Needham was content to supply itself with water from a series of 50 odd wells. Gradually the production of these wells fell below the necessary volume and Needham faced a serious water shortage. Looking about, the town fathers discovered that they were in a tight spot, for their town's water reserve had been taken over in large part by adjacent towns. Thus Needham had either to join the Metropolitan water system at a cost, including new pipes and equipment, of a half-million dollars or dig new wells. The problem which the engineers faced was that of not merely digging a new well, but finding a well that would give good quality water and a very rich supply of it. Much of the first part of 1936 was so spent — more than 50 test wells were dug, water production measured and water quality analyzed. Finally, the search narrowed down to a small area in the very western corner of the town next to Dover — a small triangle bounded by the Charles River and Charles River Street. In that area test borings showed depths of perfectly porous sand and gravel going down 93 feet in places with water both abundant and of superior quality. Geological studies made it evident that the bed was not simply a circular bed, such as the basin of an old pond, but really a section of some great river. Geological history then made it reasonably clear that the bed could be nothing less than the million year old bed of the pre-glacial Merrimac River.

With this information the Town determined to dig a real well. A contractor was hired and during the summer the work was pressed. Once completed a turbine pump was hung down in the well from a 35-ft. shaft with a 75-horsepower, slow speed Diesel motor on the ground above.

Finally, everything was ready and the engine started. Up rushed the water in a tremendous burst which rose 50 feet into the air and caused many witnesses to think the well has spouted into a perpetual geyser. State regulations required that a well should run at capacity for 21 days to determine its abundance. In 10 days, the new Needham well had unfailingly

demonstrated its ability that further testing was unnecessary. Delivering a million gallons a day, the well fell only 2.6 feet and then remained stationary.

Hundreds of people were attracted to the test. Many of them thought that since the Charles River was nearby, the new well was simply draining the water out of the Charles. Tests disproved this for the well water was a constant 48 degrees in temperature. Tests also showed that the well water was remarkably free from iron salts and dissolved carbonic acid gas — two other points of difference from the Charles. The final demonstration was that, if the well water was pumped into the Charles, if the water came from the Charles, its level should remain the same. Actually, the well filled the Charles up so high that it began to spill over the dams below — something that the Charles River itself had not been doing for weeks past. Eventually, the State Board of Health passed the well water chemically and bacteriologically and the well was a success. A stone pumping house was built over the well to cover the pumping engine and Needham had its new, safe water supply."



Understanding Our Treatment Process

Before you turn on your tap, Needham's licensed operators treat the water to comply with State and Federal drinking water regulations.

The process begins by pumping the water from the Needham wellfield, which consists of three wells, to the Charles River Water Treatment Facility (CRWTF) for process. Chlorine is added to Needham's water as a precautionary measure to kill any pathogens that may be present. Chlorine levels are continuously monitored and controlled to ensure disinfection levels are maintained at the facility and in the distribution system. Needham injects the lowest quantity needed to ensure the safety of your water without compromising taste. The water then enters four greensand pressure vessels which filter out manganese, a naturally occurring mineral in ground water. The water chemistry is then adjusted with caustic soda. This helps reduce any corrosion of lead and copper from household plumbing systems. Polyphosphate, a food based additive, is then injected into the water to minimize calcium precipitating in residential hot water systems. Finally, fluoride is added to promote dental health and reduce cavities.

We are pleased to report that during the past year the water delivered to your home complied with or exceeded all State and Federal drinking water regulations. In 2008, we collected and analyzed more than 400 water samples for over 100 potential contaminants. We tested for bacteria, volatile organic compounds, total trihalomethanes, haloacetic acids, nitrates, perchlorate, lead and copper. For your information we have listed in the table below only the substances that were detected in Needham's water. Although all the substances detected are well under the Maximum Contaminant Level (MCL) set by the U.S. EPA, we feel it is important for you to know what is present in the water. Also included are chlorine, fluoride, and manganese results after treatment at the plant.

Tested After Treatment

Substance	Units	(MCL) Highest Allowed	Needham Detected Level	Range of Detections	(MCLG) Ideal Goal	Violation	How it Gets in the Water
Chlorine	ppm	4 MRDL	0.65 average	0.55 - 0.75	4 MRDLG	NO	Water additive for disinfection
Fluoride	ppm	4 MRDL	1.00 average	0.85 - 1.10	4	NO	Water additive for dental health
Manganese	ppm	0.05	0.01 average	0.005 - 0.015	0	NO	Naturally found mineral in the earth.
Nitrate	ppm	10	0	N/A	10	NO	Runoff from fertilizer use. Leaching from septic tanks.
Sodium	ppm	N/A	67.7	N/A	N/A	NO	Natural sources, by-products of treatment process.

In The Distribution System

Substance	Units	(MCL) Highest Allowed	Needham Detected Level	Range of Detections	(MCLG) Ideal Goal	Violation	How it Gets in the Water
Total Trihalomethanes	ppb	80	25.4 average	15.1 - 43	0	NO	By-products of disinfection.
Haloacetic Acids	ppb	60	3.5 average	ND -9.23	0	NO	By-products of disinfection.

Lead & Copper - "At the Tap" Sampling

Substance	Units	(AL) Action Level	Detected Level	Number of Sites Exceeding AL	90th Percentile	Violation	How it Gets in the Water
Lead	ppb	15	0	1	6	NO	Corrosion of household plumbing systems.
Copper	ppm	1.3	0	0	0.03	NO	Corrosion of household plumbing systems.

Table Definitions

Key: **MCL**=Maximum Contaminant Level - The highest level of a contaminant allowed in water. MCL's are set as close to the MCLG's as feasible using the best available technology. **MCLG**=Maximum Contaminant Level Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety. **MRDL**=Maximum Residual Disinfectant Level - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants. **MRDLG**=Maximum Residual Disinfectant Level Goal - The level of a drinking water disinfectant below which there is no known expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants. **ppm**= parts per million - about one drop in one 55 gallon barrel of water. **ppb**=parts per billion - about one drop in 1000 barrels of water. **pCi/L**=picoCuries per liter. **AL**=Action Level - The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow. **90th Percentile** - Out of every 10 homes, 9 were at or below this level.

REGULATORY NOTIFICATION:
Due to an MWRA clerical error, the monthly bacteria report for May 2008 was not submitted to all DEP offices. Therefore, DEP was required to issue a Notice of Non-compliance (N.O.N.) to the Needham Water Division. Needham performed the required tests and submitted samples to MWRA. The results were fine and subsequently submitted to DEP.

Quality Water Begins With The Source

Groundwater from the Charles River Wellfield and surface water from the Massachusetts Water Resources Authority's (MWRA) Quabbin Reservoir provide high quality water for our many uses. Needham residents receive water from these sources depending on where they live and the season of the year.

Our primary source of drinking water is the three gravel-packed wells owned by the Town. The wells are located on the extreme westerly end of Needham on Charles River Street. Clean drinking water is pumped from the wells to the CRWTF for treatment and then sent out to the water distribution system. The wellfield supplies 80 to 90 percent of the Town's water supply and can provide approximately four million gallons of water per day.

Needham's second source of water is the Quabbin Reservoir located in western Massachusetts. This water source enters Needham's distribution system through a 36" water main that runs from the Metro West Tunnel to the St. Mary Street booster station located on Central Avenue at St. Mary Street. The Town's water supply is supplemented with water from the Quabbin Reservoir during periods of high demand, such as in the summer or in the event of an emergency. This source supplies the remaining 10 to 20 percent of water to the Town.

How Do Contaminants Get Into Source Water?

Sources of drinking water, both bottled and tap water, include water that travels over the surface of the land or through the ground. This water comes in contact with soil, rock, plants and other material as it follows nature's path to water sources. While this process helps filter and clean the water, it can also carry small amounts of material into the water. Minerals from soils and rock, including low levels of radioactive materials, do not usually cause problems in the water. But water can also carry contaminants from human and animal activity. These include bacteria, viruses, pesticides and fertilizers — some of which can cause illness. Your drinking water is routinely checked for these contaminants and other substances by State certified laboratories in accordance with Federal and State drinking water regulations. The EPA requires all water suppliers to conduct many tests before and after treatment to check the water you are drinking. In fact, Needham goes beyond the monitoring requirements to ensure Needham produces and delivers the highest quality of water to its residents. We are proud to say that Needham water meets or exceeds all drinking water standards for quality.

In order to ensure that your tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain substances in water for public water supplies. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. Bottled and tap water may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily pose a health risk.

For more information about contaminants and potential health effects, call the EPA's Safe Drinking Water Hotline at (800) 426-4791.



Special Health Information From EPA

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly persons and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.



Needham has been working with the Environmental Protection Agency to define new national drinking water rules by testing for compounds which are not regulated. Our results will be used with those of other water suppliers to help the EPA set regulations for these compounds.

Be WATER SMART – Conserve

Summer is an especially important time to save water. Needham's water supply is usually sufficient to meet normal water demands. However during the summer, residential water usage tends to increase. If we conserve just a few gallons per day, millions of gallons of water can be saved over the course of a year. Listed below are a few suggestions to use water more efficiently outdoors, make garden maintenance easier, save money, and more importantly, save our water supply for future generations.

- Use mulch in planted areas to retain water by minimizing loss through evaporation and also to prevent weed growth.
- Water new trees, shrubs and plantings with a slow trickle at the roots to encourage root growth.
- A drip (or trickle) irrigation system can save 30–70% of the water used by overhead sprinkler systems.
- Use a shut off nozzle on your hose. Save 10 gallons or more a minute.
- Never hose off sidewalks or driveways. Use a broom instead.
- Wash your car by wetting it, turning off the spray, then using soapy water from a bucket. Rinse rapidly.
- Water only when needed. Established lawns and plants need only one inch of water a week.
- Water your lawn in the early morning or late evening to avoid excess evaporation. Water evaporates 4–8 times faster during the day.

Needham's Cross Connection Control Program

Cross connections that could contaminate water distribution lines are a major concern for water suppliers. Community water supplies are continually jeopardized by cross-connections unless appropriate valves, known as backflow preventers, are installed and maintained.

A cross-connection is formed at any point where a drinking water line connects to a system containing non-potable water. Examples of these are water lines connected to equipment such as boilers, systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems) or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure in the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to occurrences such as main breaks and heavy water demand causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).

Needham is committed to protecting the public water system from contamination due to backflow or backsiphonage of connections containing non-potable water. Needham's water system is protected by the control of actual or potential cross connections through two programs:

- The elimination of existing or future cross connections through inspection and regulation of plumbing and water piping within a customer's premises.
- Proper installation and maintenance of backflow preventers on services to premises where actual or potential cross connections exist to prevent backflow or backsiphonage of contaminants or pollutants from the customers' premises into the public water system.

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. By installing a backflow prevention device it will potentially eliminate a cross-connection.

Water suppliers are required to survey all industrial, commercial and institutional facilities to ensure all cross connections are identified and eliminated or protected by an appropriate device. For more information on cross connections, please contact Anthony Lake at (781) 416-4071.

EPA Drinking Water Regulatory Update

Disinfection By products Rule:

Trihalomethanes and Haloacetic Acids are by products of disinfection which is a compound that is formed when a natural organic substance from decaying vegetation and soil react with chlorine. The maximum allowable level for Trihalomethanes are 80ppb and Haloaceticacids are 60ppb. Water samples were taken in the distribution system and levels were well below the MCL levels for those contaminants.

Perchlorate: Perchlorate is a man-made chemical found in rocket propellant.

The EPA is currently undertaking testing to determine if regulation of perchlorate in drinking water would represent an opportunity for reducing risks to health. The EPA established a contaminant level that is not expected to cause adverse health effects and which requires communities to monitor water sources for perchlorate. Needham conducted sampling in the Town's water supply. Test results indicate that perchlorate is not present in Needham's source water.

Source Water Protection

Needham's three drinking water wells are located within the same water supply protection area, with portions extending into Dover, Natick and Wellesley. The water supply protection area is divided into two zones, Zone I and Zone II. Zone I for each of the wells is a 400 foot radius around each wellhead. Drinking water regulations allow only water supply activities within Zone I. The second zone, Zone II, contributes water to the wells through the ground and surface drainage. Needham's Zone II contains potential sources of contamination that must be managed properly. Needham adopted bylaws and health regulations designed to preserve and protect existing and potential sources of drinking water supplies. The DEP approved the Town's water source protection strategy based on land use and operational restrictions.

The DEP evaluated land uses within Needham's supply protection area. The information collected was incorporated into the Source Water Assessment and Protection (SWAP) report. A susceptibility ranking of high was assigned to Needham utilizing the information collected during the assessment. A source susceptible to contamination does not indicate poor water quality. Actual quality is best reflected by results of water analyses. Water test results continue to show that your drinking water continues to exceed federal and state drinking water standards. A copy of the SWAP Report can be viewed and downloaded on DEP's website at www.mass.gov/dep/water/drinking.htm.

System Improvements in 2008

Your water travels through miles of water distribution mains and is stored in water storage tanks before it reaches your taps. Each part of the water system needs routine maintenance in order to maintain a safe and dependable water supply. Listed below are some of the significant projects undertaken by the Water and Sewer Division in 2008.

- Conducted leak detection survey of the entire water system.
- Continued a lead lined service pipe replacement program.
- Implemented a hydrant replacement program to ensure an adequate water supply for fire protection.
- Cleaned and painted the Dunster Road storage tank.
- Relined approximately 3,400 ft of 14 inch water main on Charles River St.
- Replaced approximately 820 ft of 8 inch water main on Chestnut St.
- Replaced approximately 450 ft of 12 inch water main on Crawford St.
- Updated and replaced 4 finished water filter control valves at the Water Treatment Facility.

Needham Department of Public Works
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Needham Resident

*What you should know
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Drinking Water

**2008
drinking
water test
results**

Needham Department
of
Public Works